New Insights and Methodologies Are Needed to Solve the Many Epidemiologic Enigmas of Prostate Cancer

There is a tremendous need for a comprehensive review of the many facets of the epidemiology of prostate cancer. For well over three decades, we have struggled to identify etiologic factors that might explain the almost 10-fold differences in the incidence and mortality of prostate cancer between various geographic and ethnic populations. These rate differences can change dramatically during population migration between the areas, suggesting that environmental or lifestyle factors may play a critical role in either initiating or promoting prostate cancer. However, little specific insight has been gained into identifying these etiologic factors or the mechanisms involved. We do not even know whether the important regional factors are carcinogenic or protective agents. Many suspected factors certainly have been suggested, but no conviction about an agent has been forthcoming. Therefore, simply continuing to apply present techniques may not yield the answers we are looking for or at least make it very difficult to build a compelling argument.

With new epidemiologic approaches and more specific molecular probes that can be analyzed far more rapidly and quantitatively, there is a great deal of hope for future resolution of this question. We certainly need an understanding of the limitations and advantages of these new tools and how they can be applied more meaningfully. This special issue of *Epidemiologic Reviews* contains 28 papers on important areas of study related to prostate cancer, written by experts whose experience makes these papers most valuable. In the final analysis, most critical is determining how these approaches will be integrated or fused to answer the bigger question of how we can prevent or impact upon prostate cancer. This is our mission and the purpose of this special issue.

The following six questions and insights might provide some new direction toward finding clues to this mystery:

1. The prostate and seminal vesicles lie in close proximity and are driven by androgens; however, world literature has reported only about 40 seminal vesicle cancers, while there have been millions of cases of prostate cancer. What could possibly explain this tissue specificity that varies by more than 100,000? This question is particularly perplexing since, in the individual host that contains the seminal vesicle and prostate, the organs share the same genetic and environmental background and lifestyle.

2. There are over a thousand species of mammals, and yet only humans and dogs have any significant risk of dying of prostate cancer. Aging animals who die in the zoo are devoid of prostate cancer, so why don’t cats and horses develop prostate problems as they age, as humans and dogs do?

3. Why is there an apparent relation between the incidence of prostate and breast cancers in various societies and no correlation with any other cancer that does not have a suggested estrogenic etiology?

4. Is cooking and food processing a major cause of prostate cancer, and why is stomach cancer inversely related to prostate cancer?

5. What carcinogens and protective factors are pumped into the prostatic secretion, and how are they pumped out?

6. What is the function of the prostate and seminal vesicles, and how is it related to evolution?

Certainly, basic biologic and pathobiologic questions need to be resolved before we can understand the species and tissue specificity of prostate cancer and how it tracks with western lifestyle, particularly in relation to diet. However, until more precise epidemiologic and molecular markers are studied, this endeavor may prove most difficult, particularly in light of the long time span required for prostate cancer to develop. Thoughtful time spent on each of the papers in this issue should help some scientists to synthesize the proper studies needed to answer these very enticing questions. The devastation caused by prostate cancer and increasing rates of this disease in Asia are most alarming signals. We must know why. Each reader is wished the best in trying to solve this medical problem. This special issue of *Epidemiologic Reviews* should accelerate finding the answers.

Donald S. Coffey
Department of Urology
The Johns Hopkins University School of Medicine
Baltimore, Maryland 21287